" Welcome Shelter Near Trail's End "

FEDERAL-STATE COOPERATIVE SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

MISSOURI and ARKANSAS DRAINAGE BASINS

MAY 1, 1947

By

Division of Irrigation, Soil Conservation Service

United States Department of Agriculture

and

Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.

WATER SUPPLY OUTLOOK

MISSOURI-ARKANSAS DRAINAGE BASINS

May 1, 1947

The water supply outlook for the Missouri River and its tributaries in Montana continues favorable. Snow is especially heavy near the Continental Divide and precipitation at medium elevations has been well above normal throughout the winter season. In Wyoming, the discharge of of the various streams will be above average. On the watershed of the Shoshone the water content of the snow is 50 percent above normal. Storage in Buffalo Bill Reservoir is 24 percent below last year. Snow cover on the Upper Big Horn and its tributaries ranges from 10 to 20 percent above average. Along the Lower Big Horn in Wyoming irrigation water supply prospects are good. On the headwaters of the North Platte the snow cover is slightly above normal and soil moisture and range conditions are generally good. Reservoir storage is 7 percent under last year. In the South Platte drainage irrigation water supplies will be very satisfactory due to heavy snow in the mountains, as well as lower elevations. Snow cover on the Arkansas River watershed is well above average and the summer flow should exceed 125 percent of normal.

Missouri River and Tributaries in Montana

The snow at the headwaters of the streams forming the Missouri River continues to be well above normal. Snow water content measured on the Jefferson River is 41 pct. above the 12-year average. On the other tributaries it is estimated that the summer flow will be from 15 to 50 percent above normal. The estimated flow has not changed materially since April 1. From limited snow surveys on the headwaters of the Yellowstone River, May 1 indicates the water supply situation to be slightly better than April 1. On Lodgepole course the water content of the snow is 37 percent above normal. The flow of the Missouri River into Fort Peck Reservoir is expected to be near 5,000,000 acre-feet for the April 1 to September 30 period. There is considerable variation in reservoir filling, but in general, water in storage is slightly under May 1, 1946. Seasonal precipitation has been above normal. Crop and soil moisture conditions are reported as excellent.

Wyoming

Shoshone: Storage in Buffalo Bill Reservois is now 294,000 acre-feet, which is above the past ten-year average, but only 76 percent of May 1,1946. The snow cover on the headwaters of the Shoshone is 50 percent above normal. Precipitation in the Powell area has been deficient during the whole season and the soil is now dry. Crop conditions are reported as poor at this time.

Big Horn: The estimate of summer discharge of the Wind River and its tributaries was increased slightly during April. Snow on all courses above Riverton is above normal. The discharge of the Wind River at Riverton is expected to be near 600,000 acre-feet or 70 percent above last year. For the Popo Agie the flow will be near the past 10-year average. The runoff in the Greybull River should be about the same as for the 1946 season. The deficiency in snow cover that existed April 1 on the west side of the Big Horn mountains has been overcome during April. On Shell Creek the snow cover is normal and on Tensleep it is well above.

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Soil moisture and crop conditions are reported as good in all areas. Storage in Bull Lake and Pilot Butte Reservoirs now totals 89,000 acre-feet as compared to 74,000 on May 1, 1946. Sunshine Reservoir contains 36,000 acre-feet or about the same as a year ago.

Sweetwater: Snow conditions at the head of the Sweetwater River are well above normal and much better than on May 1, 1946. The summer discharge of this stream will probably be 50 percent more than last year.

Cheyenne: The outlook for irrigation water supply is excellent. Soil moisture and crop conditions are described as very good. Stream flow into the reservoir is now above normal. Belle Fourche Reservoir is now at 90 percent of capacity.

Powder: The snow water content measured at high elevations on the Powder River watershed was very heavy for May 1. West of Kaycee on the Red Fork course the water content of the snow was 10 inches as compared to none a year ago. If the snow melt is rapid some high water damage may be expected in this area.

Tongue: Snow at the Big Goose Ranger Station is 50 percent above average. In the Sheridan area precipitation has been above normal throughout the winter season. Range and soil moisture conditions are described as excellent.

North Platte: On the upper North Platte watershed the snow cover is now 18 percent above normal. The summer discharge is expected to be about 10 percent higher than indicated on April 1. April precipitation has been below normal in the valley areas but above normal at higher elevations. The deficiency extends into western Nebraska. The flow of the North Platte at Saratoga is expected to be in excess of last year or about 600,000 acre-feet for the April-September period. Soil moisture conditions are fair to good. Crop conditions are also reported as good. Storage in the four principal reservoirs in Wyoming is now 1,067,000 acre-feet as compared to 1,154,000 a year ago. In Kingsley and Sutherland Reservoirs there is now stored 1,314,000 acre-feet, slightly above May 1, 1946.

Laramie: On the headwaters of this stream the average water content of the snow is now 14½ inches as compared to 6 last year. The twelve-year average is 11 inches. Summer discharge of this stream is expected to be well above average. Soil moisture and range conditions are described as excellent. Precipitation has been above normal with a good snow at Laramie about May 1. Stream flow is low due to cold weather.

South Platte River Basin

Cache la Poudre: Snow at higher elevations on the Poudre River watershed is 24 percent above normal. The snow water content is especially good at medium elevations around 9,000 feet. The 20.7 inches of water measured on the Deadman Hill course on the North Poudre is the maximum since 1938. Reservoir storage is very close to a year ago. Precipitation in the valley area is near normal and crop conditions are excellent.

Big Thompson: The general prospects for water supply on the Big Thompson is about the same as April 1. The snow water content is now 20 percent above normal. Soil moisture in the valley area is very good. April precipitation and stream flow was near average. Reservoir storage is about 65 percent of May 1, 1946.

St. Vrain: The water content of the snow at Wild Basin course is now 16 inches as compared to 5 inches last year on May 1. Snow cover at medium elevations is well above normal. The prospective summer runoff is practically unchanged from April 1. The April-September discharge at Lyons should be 100 percent over the 1946 season. April precipitation has been in excess of normal. Soil moisture and crop conditions are described as good.

Boulder Creek: On the headwaters of the Boulder Creeks the snow water content is 30 percent above normal. The estimate of summer runoff is the same as April 1. The April-September flow is expected to be about 65,000 acre feet. Reservoir storage is near capacity and similar to last year. Soil moisture and crop conditions are reported as very good.

Clear Creek: The snow cover on the headqaters of Clear Creek is unusually high. The May 1 water content on Loveland Pass course was the highest recorded since 1936. On April 1 it was near the highest. Soil moisture and crop conditions are excellent.

South Platte above Denver: Storage in reservoirs in South Park is now 177,500 acre-feet. On May 1, 1946 it was 193,000. The water content of the snow at higher elevations is well above average. It is 11.4 inches at the Jefferson Creek course as of May 1 which is the maximum since 1936. At Hoosier Pass the snow is 25 percent above normal. The summer runoff from the mountains surrounding South Park should be unusually high.

In the lower South Platte valley, in Colorado, the prospects for adequate supplies are excellent. Some snow water will probably flow into Nebraska. In the Fort Lupton and Fort Morgan areas the soil moisture and crop conditions are very good. In the vicinity of Sterling precipitation has been normal and soil moisture and crop conditions are also good. Storage in the principal reservoirs is 123,000 acre-feet, slightly over May 1, 1946.

As for ground water in the South Platte drainage only the Gilcrest and Fort Morgan areas show significant lowering. In these areas the water table is from 1 to 2 feet lower than a year ago. A further drop of several feet occurred in the Wellington area. Elsewhere the lowering has been slight except for a small area on Box Elder Creek in Weld County where small gains occurred. In the Prospect Valley a rise of 1 to 2 feet is noted due to filling of local reservoirs.

Arkansas River

The general outlook for irrigation water supply in the Arkansas Valley is much better than a year ago. Snow cover near the east portal of Independence Pass tunnel is the highest measured since 1936. The average snow water content for all courses is 21 percent above the average. Precipitation throughout the valley has been above average throughout the winter season. The flow of the Arkansas at Salida is estimated to be near 425,000 acre-feet for the April-September period. Reservoir storage is generally under last year on May 1. The flow of the Purgatoire will be at least normal and probably more. The season's flow of the Fountain should be normal or above but the flow of this stream is not affected materially by snow melt. Reservoir storage on the Fountain is above last year.

On the St. Charles Mesa, between Pueblo and Avondale, the water table is at the lowest in 5 years, nearly reaching the low point of 1941. From Avondale to Rocky Ford it is only slightly down from the average for the past 5 years.

MISSOURI-ARKANSAS DRAINAGE BASINS

STREAM FLOW FORECASTS, May 1, 1947

Basin and Stream	Apr.-Sept., incl., Streamflow Thousands Acre Feet				
	Forecast	Measured Runoff			10-yr.avg.
	1947	1946	1945	1944	1936-1945
YELLOWSTONE					
Shoshone below Buffalo Bill Res.	900,000	---	436,000	578,000	655,000
Wind River at Riverton	600,000	352,000	520,000	577,000	480,000
Popo Agie at Riverton	400,000	333,000	423,000	483,000	393,000
NORTH PLATTE					
Sweetwater at Alcova	65,000	49,000	--	81,000	52,000
North Platte at Saratoga	650,000	510,000	841,600	441,700	585,000
Laramie at Jelm	115,000	91,840	100,660	66,300	86,000
SOUTH PLATTE					
Poudre at Canon	300,000	200,000	253,000	211,000	245,000
Big Thompson at Drake	135,000	67,000	136,000	101,000	110,000
St. Vrain at Lyons	115,000	52,000	88,000	79,000	84,000
Boulder at Orodell	65,000	41,000	51,000	52,000	53,000
Clear Creek at Golden	210,000	--	143,000	139,000	143,000
ARKANSAS					
Arkansas at Salida	425,000	326,000	316,000	324,000	334,000
Purgatoire at Trinidad	65,000	---	---	81,660	65,000

STATUS OF RESERVOIR STORAGE, MISSOURI-ARKANSAS BASIN, May 1, 1947

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous. A.F.)	THOUSANDS OF ACRE FEET IN STORAGE					May 1, 1947		Forecast
			About May 1				10-yr.avg.	%	%	%
			1947	1946	1945	1944	1936-45	Cap.	Avg.	Capacity
MISSOURI RIVER										
Missouri River	Fort Peck	19000.0	15225.0	13270.0	11440.0	10503.0	6772.0	80	224	90
" "	Canon Ferry	37.8	35.4	36.6	19.2	30.4	22.0	94	161	--
" "	Hauser Lake	52.7	39.7	42.9	50.2	47.6	44.0	75	90	100
" "	Holter	73.6	59.5	61.7	47.3	70.8	46.2	81	129	100
" "	Gibson	105.0	64.6	76.7	71.6	83.7	72.0	62	90	75
" "	Willow Creek	32.4	16.9	11.6	22.6	17.9	9.7	52	175	75
" "	Pishkun	32.0	17.2	22.4	17.0	17.1	15.0	54	115	75
Marias River	Four Horns	20.0	11.8	5.8	5.3	8.2	8.6	59	137	--
" "	Birch Creek	30.0	28.4	26.3	27.5	28.6	20.6	95	138	100
" "	Lake Francis	112.0	105.1	103.9	100.7	108.4	55.5	94	190	100
Musselshell River	Deadmans Basin	52.5			50.5	52.0	50.1			--
" "	Martindale	23.0	12.1	9.6	12.1	11.7	11.1	53	109	--
Yellowstone River	Cooney	27.5	13.4	8.3	13.4	12.5	18.3	49	73	75
Tongue River	Tongue River	73.9	9.1	18.6	10.1	19.8	17.1	123	53	50
Milk River	Fresno	127.2	131.9	62.0	50.0	73.3	57.8	100	228	100
" "	Nelson	66.8	34.7	26.6	37.0	40.6	33.7	52	103	75
St. Marys River	Sheburne	66.0	17.6	10.7	19.2	8.7	20.6	27	86	90
Gallatin River	Mystic Lake	20.8	3.3	9.6	3.7	4.1	2.2	16	150	90
Madison River	Madison	41.0	38.5	37.4	33.8	30.3	27.4	94	140	100
" "	Hebgen	345.0	179.1	191.7	246.6	255.1	251.9	52	71	70
Jefferson River	Ruby	39.0	--	37.5	28.0	33.2	29.3			--
Cheyenne River	Belle Fourche	177.5	156.2	151.9	146.2	151.2	101.5	88	154	100
Shoshone River	Buffalo Bill	456.6	293.8	387.7	258.3	304.3	289.6	64	101	100
Wind River	Pilot Butte	30.0	20.2	21.6	20.4	23.4	21.3	67	95	75
" "	Bull Lake	155.0	68.4	52.4	50.6	79.8	48.9	44	140	65
Greybull River	Sunshine	52.0	36.0	37.0				69		
North Platte River	Kingsley-Sutherland	2180.0	1314.0	1280.0	881.6	854.0	684.5	60	192	65
" " "	Minatare	60.8	54.2	51.5	44.7	40.8	30.4	90	178	100
" " "	Alcova	190.0	150.4	143.1	124.8	104.8	109.2	79	137	--**
" " "	Seminoe	1025.0	405.3	610.7	145.2	168.8	152.8	40	267	--**
" " "	Guernsey	46.0	41.8	21.9	31.8	26.6	42.7	91	98	--**
" " "	Pathfinder	1045.5	470.4	377.5	292.2	386.9	282.0	45	168	--**
Laramie River	Wheatland	70.4		54.0	28.1	42.8	31.7			90

*Some for shorter periods

**Maximum storage in North Platte Reservoir in Wyoming will reach 1,450,000 acre-feet.

RESERVOIR STORAGE, Cont.

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous. A.F.)	THOUSANDS OF ACRE FEET IN STORAGE About May 1 1947	1946	1945	1944	10-yr.Avg. 1936-45	May 1, 1947 % Cap.	% Avg.	Forecast % Capacity
MISSOURI RIVER										
Poudre River	Windsor	18.6	12.2	13.3	11.9	14.6	12.6	66	97	100
" "	Cache la Poudre	9.5	8.7	8.9	6.6	9.0	7.7	92	113	100
" "	Fossil Creek	11.6	11.0	10.3	4.2	10.9	7.8	95	142	100
" "	Terry Lake	8.2	5.1	5.3	4.1	6.2	4.9	62	104	100
" "	Halligan	6.4	2.4	0.0	0.0	5.2	3.2	37	75	100
" "	Chamber's Lake	8.8	2.7	2.8	2.2	2.4	3.3	31	82	100
" "	Cobb Lake	34.3	0.6	4.2	8.4	8.4	3.8	2	16	25
" "	Black Hollow	8.0	4.6	4.1	2.0	4.6	2.8	58	165	100
Big Thompson River	Lake Loveland	14.3	2.4	8.2	3.6	9.7	5.2	17	46	90
" " "	Boyd Lake	34.3	12.1	24.3	25.7	26.3	11.2	35	108	90
" " "	Lone Tree	9.2	9.3	8.1	4.7	9.3	8.1	100	115	100
" " "	Mariano	4.6	4.6	3.6	2.7	4.0	3.4	100	135	100
St. Vrain River	Union	12.7	6.9	8.2	3.6	9.7	6.3	54	110	100
Boulder Creek	Barker Meadow**	11.7		5.5	0.4	2.7	4.4			100
South Platte River	Eleven Mile	81.9	81.9	81.9	81.9	81.9	59.5	100	137	100
" " "	Cheeseman	79.0	59.0	73.7	62.5	69.6	59.4	75	100	100
" " "	Marston	17.0	16.7	15.2	14.9	16.4	15.8	99	106	100
" " "	Barr Lake	32.2	28.0	25.8	26.0	28.8	20.2	88	138	100
" " "	Milton	24.4	20.2	16.3	12.2	17.1	11.1	83	180	100
" " "	Standley	18.5	12.8	17.4	13.7	14.0	13.9	69	92	100
" " "	Marshall	10.3	5.2	5.3	3.6	4.7	5.0	50	104	80
" " "	Antero	33.0	20.1	20.1	16.1	21.3	9.7	61	208	100
" " "	Horse Creek	20.6	14.2	12.3	10.4	12.1	6.8	69	209	100
" " "	Riverside	57.5	59.4	53.9	53.9	56.5	45.2	100	131	100
" " "	Empire	37.7	34.9	32.2	33.8	34.1	28.3	93	123	100
" " "	Jackson Lake	35.4	34.4	34.4	35.4	35.4	33.9	97	101	100
" " "	Prewitt	32.8	28.7	27.6	26.4	30.6	19.7	88	145	100
" " "	Point of Rocks	70.0	72.0	67.0	70.3	70.6	58.2	100	124	100
" " "	Julesburg	28.2	22.7	21.9	22.8	22.2	22.4	81	101	100

*Some for shorter periods
**Just started to refill

RESERVOIR STORAGE, Cont.

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (Thous.A F.)	THOUSANDS OF ACRE FEET IN STORAGE About May 1				10-yr.Avg.	May 1, 1947 % Cap.	% Avg.	Forecast % Capacity
			1947	1946	1945	1944	1936-45*			
ARKANSAS RIVER										
Arkansas River	Twin Lakes	57.9	15.2	29.5	14.0	20.0	19.9	26	76	100
" "	Sugar Loaf	17.4	8.0	10.0	6.1	7.6	6.7	46	120	80
" "	Clear Creek	11.4	4.4	8.6	7.7	2.6	2.6	38	169	100
" "	Meredith	41.9	26.7	23.2	33.8	30.1	30.1	64	89	100
" "	Horse Creek	26.9	16.0	14.0	11.8	8.3	8.3	60	193	75
" "	Adobe Creek	61.6	38.0	41.0	34.3	47.3	47.3	62	80	75
" "	Cucharas	40.0	2.4	5.3	10.0	3.5	3.5	6	69	50
" "	Two Buttes	40.9	7.9	0.3	0.6	0.1	0.1	19	--	40
" "	John Martin	655.0	64.9	49.9	45.9	60.1	60.1	10	108	15
" "	Great Plains	150.0	96.3	90.3	118.2	46.1	46.1	64	208	75
Purgatoire River	Model**	6.2	3.4	3.6	5.0	7.8	7.8	55	44	75

*Some for shorter periods.
**Resurveyed in 1946

SNOW SURVEYS AND IRRIGATION WATER FORECASTS FOR MISSOURI AND ARKANSAS RIVERS
May 1, 1947

PRECIPITATION DATA

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation April*	Departure from Normal
		Inches	Inches	Inches	Inches
Missouri	East. Mont.	5.55	+0.79	1.33	+0.25
Missouri	Cent. Mont.	6.96	+1.20	0.85	-0.32
Missouri	North Wyo.	11.11	+0.84	1.64	-0.20
North Platte	Wyoming	8.32	+1.09	2.05	+0.43
South Platte	Colorado	11.19	+3.88	1.77	-0.30
Arkansas	Colorado	10.26	+1.87	2.28	+0.14

April precipitation ranged from slightly below normal to slightly above normal over the watersheds of the Missouri and Arkansas rivers. The accumulated precipitation was above normal throughout the area.

*April precipitation tentative.

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA
WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1947 Water Content in percent of	
	Twelve Year Avg.*	1946	1947	Twelve Year Avg.*	1946	1947		Twelve year Avg.*	1946	1947	Twelve year Avg.*	1946
MISSOURI RIVER	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
Jefferson River	26.8	24.4	34.8	10.2	9.2	14.4	3	38	38	42	141	157
Madison River	38.7	43.0	49.8	16.7	18.7	21.3	5	43	43	43	127	113
Gallatin River	30.3	30.3	41.2	11.1	11.3	16.7	3	37	37	40	150	148
Missouri River**	14.5	6.2	21.1	4.7	1.6	7.5	5	32	26	35	159	470
Marias River	14.9	19.0	22.4	6.8	8.8	11.5	1	45	46	51	170	131
Yellowstone River	23.4	23.0	34.4	7.8	8.3	10.7	1	33	36	31	137	129
Shoshone River	37.8	27.9	55.2	14.2	8.7	21.1	2	38	31	38	149	243
Bighorn River	24.7	9.4	32.8	8.2	2.7	10.3	10	33	29	32	126	380
Tongue River	9.3	0.0	12.7	3.0	0.0	4.5	1	32	--	35	150	--
Powder River	16.3	0.0	25.0	5.0	0.0	8.3	2	31	--	33	166	--
North Platte River	43.7	24.5	54.8	16.9	11.4	20.0	11	39	47	37	118	175
Sweetwater River	34.9	7.6	42.3	11.9	3.0	13.7	2	34	40	33	116	457
Laramie River	30.6	17.0	41.2	10.8	5.8	14.5	8	35	34	35	134	250
Crow Creek	8.7	0.0	14.0	2.6	0.0	4.7	1	30	--	33	181	--
South Platte ***	16.8	9.9	25.8	5.1	2.2	81.	3	30	22	31	159	370
Poudre River	34.6	20.8	43.7	12.4	9.4	15.3	6	36	45	35	124	164
Big Thompson River	53.8	28.9	61.0	18.0	10.3	21.6	2	33	36	35	120	210
St. Vrain River	37.4	12.9	45.4	13.3	4.7	15.6	1	36	36	34	118	332
Boulder Creek	36.2	19.2	38.4	11.6	8.6	15.1	2	32	45	40	130	177
Clear Creek	46.2	23.6	58.5	15.6	7.6	21.2	2	34	32	36	136	278
ARKANSAS RIVER	25.0	9.8	30.9	8.8	2.9	10.6	9	35	30	34	121	366

*Some for shorter periods. **Between Helena and Great Falls ***Above Denver, Colo.

MISSOURI-ARKANSAS RIVERS SNOW SUFVEYS, May 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION No. and State	Sec.	Twp.	Range	Elev.	SNOW COURSE MEASUREMENTS Date of Survey	Snow Depth (Inches)	Water Content (Inches) 1947	1946	1945	Years of Record	Past Record Av. Water Content (Inches)
MISSOURI RIVER												
JEFFERSON RIVER												
East Fork R.S	7 Mont	16	2N	17W	5400	4/29	0.0	0.0	0.0	0.0	10	0.0
Gibbons Pass	10 "	4	2S	19W	7100	4/29	56.4	25.4	17.4	17.6	11	18.3
Pipestone Pass	30 "	11	1N	7W	7200				0.0	5.2		
Elkhorn Hot Spg	"	15	4S	12W	8450							
Stormlake	"	19	4N	13W	8100	5/1	48.0	17.9	10.1	13.1	11	12.2
			Average for drainage				34.8	14.4	9.2	10.2		10.2
MADISON RIVER												
Aster Creek*	2 Wyo.		44.3N	110.6W	7700	4/15	88.0	36.8	34.7	--	10	29.0
Lewis L.Divide*	8 "		44.2N	110.7W	7900	4/15	117.0	49.6	45.6	33.2	11	40.4
West Yellowstone	16 Mont.	34	13S	5E	6700	5/2	8.6	3.7	1.8	2.1	12	2.6
Twenty-one Mile*	"	1	11S	5E	7150	5/2	31.8	14.6	10.3	7.3	12	9.5
Hebgen Dam	"	22	11S	3E	6550	5/2	3.6	1.6	1.2	2.2	11	2.0
			Average for drainage				49.8	21.3	18.7			16.7
GALLATIN RIVER												
Devil's Slide	Mont.	14	5S	6E	8100	5/3	70.5	28.2	22.3	18.3	12	20.4
Hood Meadow Extn.	"	22	4S	6E	6600	5/3	21.2	7.3	1.3	6.0	12	3.5
Twenty-one Mile	"	1	11S	5E	7150	5/2	31.8	14.6	10.3	7.3	12	9.5
			Average for drainage				41.2	16.7	11.3	10.5		11.1
MISSOURI RIVER**												
Chessman Res.	6 Mont.	2	8N	6W	6200	5/2	3.4	1.2	0.0	3.6	11	1.1
Stemple Pass	36 "	16	13N	7W	6900	--	21.6	7.8	2.0	10.0	11	5.1
Lower Rimini	41 "	13	8N	6W	6250	5/1	6.8	2.1	T	5.9	11	1.5
Middle Rimini	42 "	13	8N	6W	6800	5/1	32.2	11.8	1.4	9.6	11	6.2
Upper Rimini	43 "	19	8N	5W	8000	5/1	41.7	14.6	4.6	12.8	11	9.5
			Average for drainage				21.1	7.5	1.6	8.4		4.7
MARIAS RIVER												
Desert Mountain	7 Mont.	24	31N	19W	5600				0.0	14.9		
Marias Pass	20 "		48.3N	113.4W	5250	5/4	22.4	11.5	8.8	14.3	12	6.8
			Average for drainage				22.4	11.5	8.8	14.3		6.8
YELLOWSTONE RIVER												
Lodgepole	43 Wyo	32	56N	106W	8200	4/29	34.4	10.7	8.3	9.2	11	7.8

*On adjacent drainage

MISSOURI-ARKANSAS RIVERS SNOW SURVEYS, May 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION					SNOW COURSE MEASUREMENTS						
								Water Content (Inches)				Past Record
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	1947	1946	1945	Years of Record	Av. Water Content (Inches)
MISSOURI RIVER												
SHOSHONE RIVER												
Sylvan Pass	32 Wyo.	12	52N	110W	7100	4/29	37.7	13.8	4.0	9.7	11	7.6
Brooks Lake #3*	50 "	23	44N	110W	9200	4/30	72.7	28.4	13.4	17.9	12	20.9
			Average for drainage				55.2	21.1	8.7	13.8		14.2
BIG HORN RIVER												
Tensleep R.S.	13 Wyo.	30	49N	86W	8300	5/1	30.2	7.4	0.6	5.8	12	4.1
Ranger Creek	16 "	32	53N	88W	8800	4/30	30.4	6.0	2.7	10.4	12	6.6
Sawmill Glade	45 "	3	31N	101W	8500	5/2	12.4	5.6	0.0	13.5	8	6.1
Blue Ridge	46 "	23	31N	101W	9500	5/2	42.7	12.7	3.3	17.4	8	11.2
South Pass	47 "	13	30N	101W	9000	5/1	43.6	14.7	3.6	18.1	8	12.0
Wood River	48 "	28	46N	103W	8000	4/28	16.9	5.5	0.7	8.6	7	3.3
Sheridan Cr.R.S.	49 "	3	42N	109W	7500	4/29	8.8	3.0	--	0.0	10	1.0
Brooks Lake #3	50 "	23	44N	110W	9200	4/30	72.7	28.4	13.4	17.9	12	20.9
St.Lawrence R.S.	51 "	26	1N	4W	9000	5/2	23.1	5.7	--	--	5	8.2
Mosquito Park R.S.	52 "	23	2S	3W	9500	5/1	29.1	7.7	1.8	--	5	8.9
DuNoir	53 "	27	42N	108W	8760	4/29	33.4	10.9	1.0	6.9	7	6.4
T-Cross Ranch	54 "	1	43N	107W	8000	4/29	17.2	4.5	0.0	1.4	7	2.2
			Average for drainage				32.8	10.3	2.7	10.0		8.2
POWDER RIVER												
Red Fork	30 Wyo.	18	43N	85W	7500	4/29	28.6	10.0	0.0	7.6	11	4.4
Sour Dough	31 "	17	49N	84W	8500	4/29	21.5	6.6	0.0	8.1	11	5.5
			Average for drainage				25.0	8.3	0.0	7.9		5.0
TONGUE RIVER												
Big Goose Cr.R.S.	17 Wyo.	4	53N	86W	7700	5/2	12.7	4.5	0.0	8.0	12	3.0
SWEETWATER RIVER												
Grannier Meadows	29 Wyo.	19	30N	100W	9000	5/1	41.0	12.7	2.3	20.0	11	11.8
South Pass*	47 "	13	30N	101W	9000	5/1	43.6	14.7	3.6	18.1	8	12.0
			Average for drainage				42.3	13.7	3.0	19.0		11.9

*On Adjacent Drainage

MISSOURI-ARKANSAS RIVERS SNOW SURVEYS, May 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION No. and State	Sec.	Twp.	Range	Elev.	SNOW COURSE MEASUREMENTS Date of Survey	Snow Depth (Inches)	Water Content (Inches) 1947	1946	1945	Years of Record	Past Record Av. Water Content (Inches)
MISSOURI RIVER												
NORTH PLATTE RIVER												
Cameron Pass	1 Colo.	2	6N	76W	10300	4/28	74.1	25.9	28.5	24.1	12	23.8
Park View	7 "	24	5N	78W	9200	4/30	32.7	10.2	2.6	9.7	12	7.3
Columbine Lodge	8 "	21	5N	82W	9300	5/1	48.0	20.0	10.9	25.5	12	18.8
Big Creek Lake	51 "	9	11N	82W	9000	5/1	31.1	10.9	1.4	--	8	5.4
Willow Cr.Pass*	62 "	1	4N	78W	9500	4/30	45.9	16.1	5.0	15.0	10	12.4
Bottle Creek	7 Wyo.	24	14N	85W	8200	4/29	28.8	10.8	1.0	16.7	12	8.2
Webber Spring	8 "	27	14N	85W	9000	4/29	41.3	16.1	7.6	20.2	12	16.7
Old Battle	9 "	29	14N	85W	9800	4/29	91.0	36.2	24.9	39.3	12	32.4
N.French Creek	37 "	27	16N	80W	10200	4/29	98.1	36.1	29.4	35.5	10	33.0
N.Barrett Creek#2	38 "	30	16N	80W	9400	4/30	73.5	25.2	13.9	27.5	12	21.1
Ryan Park #2	39 "	34	16N	81W	8400	4/30	39.1	12.5	0.0	13.4	12	6.9
			Average for drainage				54.8	20.0	11.4	22.7		16.9
LARAMIE RIVER												
Brooklyn Lake	3 Wyo.	11	16N	79W	10200	4/30	72.5	27.7	14.7	28.0	12	22.1
Fox Park	11 "	21	13N	78W	9200	4/30	26.2	11.1	0.6	14.4	12	7.6
Pole Mtn.#2*	34 "	35	15N	72W	8700	5/1	14.0	4.7	0.0	8.3	11	2.6
Libby Lodge #2	35 "	29	16N	78W	8700	4/30	25.9	9.1	0.6	11.9	12	4.3
Hairpin Turn #2	36 "	24	16N	79W	9500	4/30	39.6	13.2	5.0	14.5	12	10.1
W.Port.G-P.Tun.	4 Colo.	7	8N	75W	8600	4/27	19.3	6.3	1.0	6.2	11	4.0
Deadman Hill*	50 "	26	10N	75W	10200	5/2	58.9	20.7	11.6	18.8	9	16.5
Roach	88 "	5	10N	77W	9800	4/30	73.6	23.4	12.8	21.4	7	18.9
			Average for drainage				41.2	14.5	5.8	15.4		10.8
CROW CREEK												
Pole Mtn.#2	34 Wyo.	35	15N	72W	8700	5/1	14.0	4.7	0.0	8.3	11	2.6
POUIRE RIVER												
Cameron Pass	1 Colo.	2	6N	76W	10300	4/28	74.1	25.9	28.5	24.1	12	23.8
Chambers Lake	2 "	6	7N	75W	9000	4/27	19.1	8.0	0.4	5.7	12	3.8
Big South	3 "	33	8N	75W	8600	4/26	6.5	2.1	0.0	0.6	12	0.6
Deadman Hill	50 "	26	10N	75W	10200	5/2	58.9	20.7	11.6	18.8	9	16.5
Lake Irene*	65 "	8	5N	75W	10600	4/29	71.3	27.1	15.2	26.8	10	23.3
Hour Glass Lake	68 "	18	7N	73W	9500	4/27	32.2	8.1	1.0	--	8	6.8
			Average for drainage				43.7	15.3	9.4	15.2		12.4

*On adjacent drainage

MISSOURI-ARKANSAS RIVERS SNOW SURVEYS, May 1, 1947

DRAINAGE BASIN and SNOW COURSE	LOCATION No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	SNOW COURSE MEASUREMENTS Water Content (Inches) 1947	1946	1945	Past Record Years of Record	Av. Water Content (Inches)
MISSOURI RIVER												
BIG THOMPSON RIVER												
Lake Irene*	65 Colo.	8	5N	75W	10600	4/29	71.3	27.1	15.2	26.8	10	23.3
Hidden Valley #2	95 "	23	5N	74W	9550	4/30	50.8	16.1	5.4	16.3	7	12.7
						Average for drainage	61.0	21.6	10.3	21.6		18.0
ST.VRAIN RIVER												
Wild Basin	41 Colo.	24	3N	74W	10000	4/30	45.4	15.6	4.7	19.0	12	13.3
BOULDER CREEK												
E.Port.Moffat T.	5 Colo.	2	2S	74W	9400	5/2	7.3	2.8	0.0	2.6	12	1.7
University Camp#2	60 "	28	1N	73W	10300	5/1	69.5	27.4	17.2	26.0	10	21.4
						Average for drainage	38.4	15.1	8.6	17.4		11.6
CLEAR CREEK												
Loveland Pass #2	61 Colo.	37	4S	76W	10100	4/30	52.9	19.5	3.4	15.8	12	12.9
Grizzly Peak*	97 "	2	5S	76W	11250	4/30	64.1	23.0	11.9	18.9	6	18.2
						Average for drainage	58.5	21.2	7.6	17.4		15.6
SOUTH PLATTE RIVER (Above Denver)												
Hoosier Pass	14 Colo.	13	8S	78W	11400	4/30	40.4	13.0	4.3	10.8	12	10.2
Fairplay	15 "	33	9S	77W	10000	4/30	0.0	0.0	0.0	0.0	12	0.1
Jefferson Cr.#2	83 "	14	7S	76W	10100	4/30	36.9	11.4	2.3	8.6	11	4.9
						Average for drainage	25.8	8.1	2.2	6.5		5.1
ARKANSAS RIVER												
ARKANSAS RIVER												
Tennessee Pass	19 Colo.	21	8S	80W	10200	5/1	30.5	8.6	0.0	6.5	12	5.1
Twin Lakes T.	21 "	22	11S	82W	10500	4/28	42.1	14.1	--	10.8	11	8.8
Marshall Cr.*	42 "	24	48N	6E	10800	4/29	39.6	12.1	1.9	16.1	12	10.3
Poncha Cr.	43 "	19	48N	7E	10500	4/29	33.0	11.1	1.3	15.1	12	8.4
Whiskey Cr.#2	72 "		37.2N	105.2W	10300	4/30	12.1	4.6	0.0	6.0	10	5.3
La Veta Pass#2*	74 "	22	28S	70W	9300	4/30	12.1	5.0	0.0	8.7	12	4.3
Four Mile Park #2	78 "	23	11S	81W	9700	5/1	0.0	0.0	0.0	--	10	0.2
Fremont Pass #2*	79 "	2	8S	79W	11400	4/30	66.9	22.0	13.0	15.6	12	16.8
Blue Lakes	81 "	30	31S	69W	10000	4/30	31.3	11.7	0.0	11.9	10	7.7
Monarch Pass	92 "	16	49N	6E	10500	4/30	52.9	20.5	9.6	20.9	7	18.8
						Average for drainage	30.9	10.6	2.9	11.3		8.8

*Or adjacent drainage

The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds by furnishing funds or services.

STATE
- Colorado State Engineer
- Wyoming State Engineer
- Utah State Engineer
- New Mexico State Engineer
- Montana State Engineer
- Nebraska State Engineer
- Colorado Experiment Station
- Colorado Extension Service
- Montana Experiment Station
- Utah Experiment Station

FEDERAL
- Department of Agriculture
  - Forest Service
  - Soil Conservation Service
- Department of Interior
  - Bureau of Reclamation
  - Indian Service
  - Geological Survey
  - National Park Service
- Department of Commerce
  - Weather Bureau
- War Department
  - Army Engineer Corps

PUBLIC UTILITIES
- Colorado Public Service Company
- Western Colorado Power Company
- Montana Power Company
- Denver and Rio Grande Western R. R. Company

MUNICIPALITIES
- City of Bozeman
- City of Denver
- City of Boulder

WATER USERS ORGANIZATIONS
- Poudre Valley Water Users' Association
- Arkansas Valley Ditch Association
- Colorado River Water Conservation District

IRRIGATION PROJECTS
- Farmers Reservoir and Irrigation Company
- San Luis Valley Irrigation District
- Santa Maria Reservoir Company
- Costilla Land Company
- Uncompahgre Valley Water Users' Association
- Wyoming Development Company
- Goshen Irrigation District
- Kendrick Project
- Pathfinder Irrigation District
- Salt River Valley Water Users' Association
- San Carlos Irrigation and Drainage District
- Twin Lakes Reservoir and Canal Company

Many other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.